Building The Wireless Future

CTIA
Cellular
Telecommunications
Industry Association
1250 Connecticut
Avenue, N.W.
Suite 200
Washington, D.C. 20036
202-785-0081 Telephone
202-785-0721 Fax

PCS WHITE PAPER No. 5
Second Series

Financing the Wireless Marketplace:

How Smaller Blocks of Spectrum and Geography

Can Build A Better Industry

May 9, 1994

Financing the Wireless Marketplace: How Smaller Blocks of Spectrum and Geography Can Build A Better Industry

In its Reconsideration of the *Second Report and Order*[1] on Personal Communications Service (PCS), the FCC should eliminate the hodgepodge of spectrum sizes and recognize that as technology advances the need for large spectrum blocks recedes.

MCI's recent commitment of $ 1.3 billion for a 17 percent share in NEXTEL Communications -- a company using an average of 10 MHz per market -- demonstrates the faith of investors and the financial markets in companies using small spectrum blocks.

In fact:

- **Companies actually using spectrum blocks as small as 10 MHz have demonstrated they are sufficient for advanced wireless services. (see p.3)**

- **A majority of parties to the PCS proceeding support smaller spectrum blocks of 20 MHz or less, citing both technical and economic reasons for these building blocks. (see p.6)**

- **A 10 MHz and 20 MHz allocation regime is more consistent with the Commission's mandates of competitive service delivery, technological innovation, and spectrum efficiency than the current regime. (see p.8)**

Modifying the PCS Second Report and Order to create four 20 MHz blocks while maintaining four 10 MHz blocks will encourage capital investment, foster the development of sustainable companies, and create new job opportunities in the vital telecommunications sector.

The Financial Markets Have Faith in Small Blocks

As Bear Stearns observed prior to the MCI-NEXTEL deal, "Over the past couple of years, Specialized Mobile Radio (SMR) has transformed itself from an overlooked player of the wireless communications world into a star at center stage"[2] -- all done with an average of 10 MHz or less of spectrum per market.

---

[1] *Second Report and Order, Amendment of the Commission's Rules to Establish New Personal Communications Services*, GEN Docket No. 90-314, 8 FCC Rcd. 7700 (1993).

[2] Bear Stearns Wireless Communications Equity Research, *Telecommunications Untethered: Our Outlook for the Wireless Communications Industry*, January 12, 1994, at p.39.

As was noted in a PCS financing conference last year, "10 MHz blocks are respectable and useful for new-service provisions."[3] As Charles Diao of Prudential Securities said, in putting a high value to NEXTEL's small spectrum blocks, "Spectrum is only worth what you do with it."[4]

Indeed, the financial markets have broadly supported the growth of SMR-based providers into Enhanced Specialized Mobile Service (ESMR). ESMR companies are winning plaudits from analysts and substantial financial backing from financial institutions, venture capitalists, and other institutional investors.[5]

Even prior to MCI's recent investment in NEXTEL, ESMR companies repeatedly won investor support. For example, CenCall's initial public offering raised more than $ 95 million in August 1993, and its total equity has a market value of over $ 1.2 billion. Dial Page won commitments from Fidelity Capital, Boston Ventures, The Hillman Company, J.P. Morgan Capital Corporation, and Fleet Equity Partners.[6] Prior to the MCI alliance, NEXTEL had raised over $ 1 billion from Comcast, Matsushita, Northern Telecom, Motorola and Nippon Telegraph and Telephone of Japan.[7] Geotek received investment commitments from George Soros and Vanguard Communications, and Motorola took substantial equity positions in CenCall, Dial Page and NEXTEL.[8]

Merrill Lynch alone has raised more than $ 1.6 billion for SMR companies.[9]

---

[3] "Venture Capitalists Hold Out Money Carrot to Bidders," *PCS News*, October 28, 1993, at p.9.

[4] *Id.*

[5] Seth Malgieri, "SMRs Becoming hot investment in 1990s wireless technology," *RCR*, November 4, 1993, at p.21. "Oppenheimer Reiterates Buy on SMR Phone Companies," *Reuters, Ltd.*, November 19, 1993. *See also* "Questar and Fidelity subsidiaries create joint wireless venture," *PR Newswire*, June 9, 1993; "Dial Page Plans to build enhanced SMR network in southeast; agrees with Fidelity to form SMR partnership; announces SMR channel acquisitions and FCC construction waiver," *PR Newswire*, June 28, 1993; "Vanguard to invest in and form strategic alliance with Geotek Industries, Inc.," *PR Newswire*, November 4, 1993.

[6] "CenCall Communications Hires Floathe Johnson and Hill and Knowlton for communications team," *PR Newswire*, November 11, 1993. "Dial Page Plans to build enhanced SMR network in southeast; agrees with Fidelity to form SMR partnership; announces SMR channel acquisitions and FCC construction waiver," *PR Newswire*, June 28, 1993.

[7] Louise Kehoe, "Dark Horse Nextel looks for a winning line - A look at a company making an impact in the U.S. cellular telephone sector," *Financial Times*, November 12, 1993, at p.24.

[8] "Motorola to Exchange Radio Dispatch Frequency Licenses in 12 states for interest in Dial Page," and "Motorola Exchanges Radio Dispatch Frequency Licenses in 17 states for interest in CenCall," *PR Newswire*, October 22, 1993. *See also* "Motorola, NEXTEL Agree to Sale of SMR Frequencies," *PR Newswire*, November 9, 1993.

[9] *See* "The Difference Between Vision and Reality," *The Wall Street Journal*, February 24, 1994, at p.C26 (insert).

Financing for PCS companies should be available from similar sources.[10] As conferences have indicated over the past year, at the very least venture capital will be available in the post-auction period, while financiers will favor experienced management teams.[11] Total venture capital available this year has been estimated around $ 3.2 billion, and the sums recently raised by Merrill Lynch indicate that bearish projections are too pessimistic.[12]

Actual Events Indicate Small Blocks Can Sustain Viable Services

Entrepreneurs experienced in the provision of wireless services, and potential users such as utilities and government agencies, have concluded that spectrum blocks of 10 MHz to 20 MHz are all that is needed to offer a PCS service. In fact, *developments in the wireless marketplace demonstrate that many companies are prepared to offer service using digital technology and such smaller blocks of spectrum.*

Justin Jaschke, President of OneComm (then CenCall Communications), made precisely these points when he met with the Commission staff on February 4, 1994. As OneComm has demonstrated, using digital technology with 10 MHz spectrum blocks provides capacity greater than analog cellular systems. Mr. Jaschke further noted that such blocks permit providers to closely align the development and deployment of systems with the demand for service, thereby avoiding spectrum warehousing and fostering the ability of new entrants to both raise capital and reach service markets.

Where is the evidence for this? **Right here.** OneComm, Dial Call (Dial Page's Specialized Mobile Radio (SMR) subsidiary), Geotek, NEXTEL, Pittencrief Communications and numerous other ESMR providers have assembled a *total* of 5 MHz to 10 MHz in each of their markets as the basis for their next generation of wireless services.

---

[10] *See e.g.*, "Venture Capitalists Hold Out Money Carrot to Bidders," *PCS News*, October 28, 1993, at p.9; "Venture Capital, Other Investment Funds Seen for Telecommunications Companies," *Telocator Bulletin*, January 14, 1994, at pp. 5-6.

[11] *See* "Obtaining Financing, Creating Business Plan Among Key Topics," *PCIA Bulletin,* March 18, 1994, at pp. 7-8.

[12] *See i.d. See also* "Venture Capitalists Hold Out Money Carrot to Bidders," *PCS News*, October 28, 1993, at p.9; "Venture Capital, Other Investment Funds Seen for Telecommunications Companies," *Telocator Bulletin*, January 14, 1994, at pp. 5-6.

For example, Dial Page's recent acquisitions in Florida will give it the equivalent of 3.5 to 5 MHz in those markets.[13] Geotek's acquisition of Metro Net Systems' 800 MHz SMR channels in New York will give Geotek an additional 3.5 MHz in the New York area, beyond its existing 900 MHz channels.[14] CenCall has acquired the equivalent of 10 MHz in the St. Louis area.[15] Pittencrief Communications has acquired between 5 MHz and 10 MHz in markets such as Oklahoma City and Dallas/Ft. Worth.[16] Companies such as Racom Corporation and American Digital Communications (formerly Mont Rouge Resources) have also begun formation of ESMR systems, using anywhere from five to 66 channels per site (the equivalent of between 250 kHz and 3.3 MHz).[17]

And *other companies are proving a broad range of services are possible for these systems.* Companies like Racotek and Gandolph Mobile Systems have proved that SMRs' frequencies can sustain viable data applications by providing data solutions to customers using SMR/ESMR networks. *Racotek provides mobile data communications services for SMR users in more than 15,000 cities across North America.*[18] Companies like Titan Mobile Data and Fujitsu Personal Systems of Santa Clara, California, are also demonstrating the viability of this market by developing hardware for wireless data applications for SMR users.[19] Motorola's MIRS technology, which underpins many SMRs, includes both voice and data

---

[13]"Dial Page to acquire systems of Advanced Radio Communications Services of Florida, Inc.," *PR Newswire,* October 25, 1993; "Motorola to exchange radio dispatch frequency licenses in 12 states for interest in Dial Page," *PR Newswire,* October 25, 1993.

[14]*Telocator Bulletin*, October 22, 1993, at p.6.

[15]"CenCall Communications Completes St. Louis Acquisitions," *PR Newswire*, January 31, 1994; *see also* Standard & Poor's, *Daily News*, November 9, 1993.

[16]*See e.g.*, "Pittencrief Communications Inc. announces purchase agreement with Industrial Radio Inc.," *Business Wire*, November 15, 1993.

[17]*Telocator Bulletin*, October 15, 1993, at pp.6-7; "American Digital Communications Inc. announces purchase of SMR system in Reno, Nev.," *PR Newswire,* January 19, 1994; "American Digital Communications Inc. announces the acquisition of SMR systems covering over 2,800 miles of interstate," *PR Newswire,* January 11, 1994.

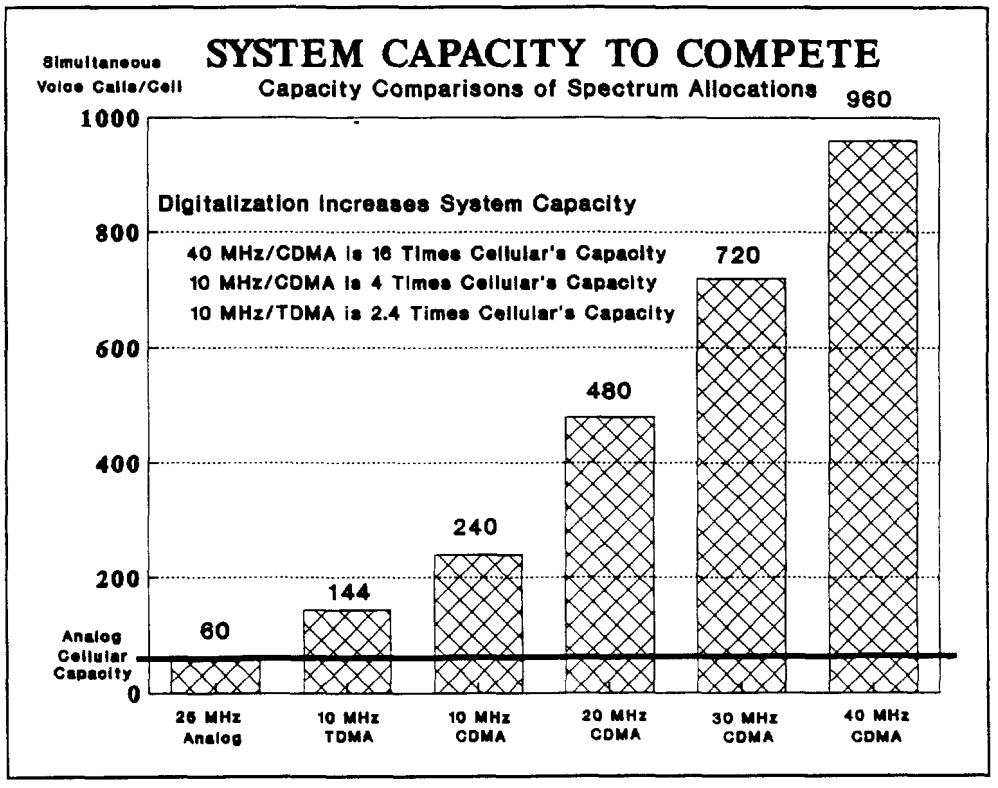
[18]Racotek's reach has recently expanded beyond these markets. *See* "Racotek and Motorola reach agreement to have Motorola representatives sell Racotek wireless data; Motorola representatives to introduce Racotek mobile data services to targeted Fortune 1000 companies," *Business Wire*, March 16, 1994.

[19]"Yearend Review: Verticals Remain Slow, But SMRs Show Promise; Omnitracs Booms," *En Route Technology,* January 17, 1994. "Fujitsu Personal Systems and ICS partnership brings wireless mobile computing to LTL trucking industry," *Business Wire*, August 23, 1993.

capabilities.[20]

The wastefulness of the Commission's 30 MHz blocks is underscored by the fact that these companies are building viable businesses around digital technology and smaller spectrum blocks of 10 MHz of spectrum or less.

This is possible because digital systems provide much greater capacity than analog cellular systems. For example, *Code Division Multiple Access* (CDMA) uses a low-power signal spread across a designated bandwidth, and assigns codes to the calls to ensure proper delivery. CDMA is estimated to increase capacity by at least ten times the capacity of analog cellular systems. *Time Division Multiple Access* (TDMA) splits a signal into pieces and, by assigning the parts to different time slots, permits a single channel to be used to deliver six simultaneous messages. Through engineering techniques, a 10 MHz TDMA system can carry *at least* 144 simultaneous voice calls compared to a 25 MHz analog cellular system's 60 calls.



[20] "Remarks by Mort Topfer, president, Motorola Land Mobile Products Sector, regarding the Nextel-Motorola agreement," *Business Wire*, November 9, 1993.

These facts should militate against overly-large allocations *as the default standard.* As the Commission has repeatedly expressed concern over spectrum efficiency, it would be inconsistent to assign spectrum without regard to efficiency in this proceeding.[21]

The Record Supports Using Building Blocks

Both the *Second Report and Order* and Commissioner Barrett's dissent noted that *the majority of commentors supported smaller spectrum blocks of 20 MHz or less.*

As NEXTEL, PowerSpectrum and other experienced wireless service providers -- and users -- have argued in the PCS proceeding, a wide range of services can be provided via spectrum-efficient technologies.

For example, in its PCS comments, NEXTEL (then Fleet Call) argued that "a 15 MHz per licensee assignment would provide each licensee more capacity than today's analog cellular systems through using spectrum conserving technologies, such as six times analog Time Division Multiple Access technology."

In its reconsideration petition, NEXTEL also pointed out that in "each of its major markets across the country, NEXTEL has less than 10 MHz of spectrum," and that "the record . . . does not identify any PCS service requiring a 30 MHz allocation."[22] NEXTEL argued that "the Commission should license PCS spectrum in 20 MHz and 10 MHz blocks, eliminating the inefficient and unjustified 30 MHz blocks."[23]

NEXTEL rebutted the argument that microwave interference justifies such large blocks by noting that "The very worst thing the Commission could do in the face of spectrum scarcity would be to permit licensees to waste 'spectral room' in solving short-term interference problems that can and should be addressed through development and deployment of advanced, spectrally-efficient technologies. . . . a mixture of 10 MHz and 20 MHz allocations will more than suffice to allow

---

[21] *See e.g., Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band,* PR Docket No. 93-144, 8 FCC Rcd 3950 at 3959 para. 37 (citing 47 U.S.C. Section 332(a)(2) for the principle that "because spectrum is a scarce resource, it is in the public interest that it be used efficiently").

[22] NEXTEL Petition for Reconsideration (PFR), filed November 18, 1993, at i.

[23] *Id.*

development of PCS to proceed while incumbent users are being relocated."[24]

The SMR provider PowerSpectrum argued in its PCS comments that:

> [T]he allocation of less spectrum per provider would encourage competition as well as promote the efficient use of the spectrum. Because PCS will be a commercial service, licensees will be encouraged to provide service to the greatest number of customers possible within their spectrum allocation. By increasing the amount of spectrum for which each entity is licensed, the Commission necessarily reduces the incentive for spectrum efficiency. Conversely, by reducing the amount of spectrum for each provider, and increasing the number of providers in a market area, the Commission will spur the use of spectrum efficient technologies.[25]

PowerSpectrum recommended "the adoption of a licensing scheme that would permit the use of between 10 and 20 MHz for each service provider," holding that "There is no reason to allocate more than 10-15 MHz of spectrum for a service provider. Proponents of advanced digital technologies, including broad band spectrum techniques, have long claimed they can perform efficiently with 10 MHz of bandwidth."[26]

City Utilities of Springfield, Missouri, argued in its PCS comments that a 10 MHz allocation would be sufficient for the provision of what it described as "utility PCS," in order to "use the data/telemetry capability of PCS to identify the locations of its bus/transit fleet and its repair and service vehicles, provide mobile alarm functions and improved service dispatching . . . [as well as] significant voice communication requirements relative to those same units."[27] As it further noted, "such utility related use would not nearly tax the capacity of even a 10 MHz PCS system."[28]

Other wireless service providers have made even more far-reaching proposals. Pass Word, Inc., a radio common carrier and private carrier paging licensee, endorsed

---

[24]NEXTEL Opposition to Petitions for Reconsideration, filed December 30, 1993, at 11-12.

[25]Comments of PowerSpectrum, filed November 9, 1992, at p.4.

[26]*Id.*

[27]Comments of City Utilities of Springfield, Missouri, filed November 9, 1992, at p.6.

[28]*Id.*

twenty licensees per area, allocating 5 MHz per licensee.[29]

Even advocates of a strategy whereby the Commission could start with large spectrum blocks and allow their disaggregation and transfer by licensees, such as Advanced MobileComm Technologies, Inc., and Digital Spread Spectrum Technologies, Inc., have affirmed that "10 MHz PCS allocations ultimately will offer effective system capacity well in excess of that available to the analog cellular systems in operations today."[30]

Keeping Faith with the Commission's Mandates and Objectives

The Commission will keep faith with its mandates to foster competition and innovative technologies, and its objective of promoting the efficient use of the spectrum resource, by using "building blocks" of 10 MHz and 20 MHz instead of tying up vast amounts of spectrum in a single license.

In fact, when it adopted the use of 20 MHz and 10 MHz spectrum blocks as part of the hodgepodge of spectrum allocations, the Commission conceded that both were sufficient for viable PCS services. And, under a "building block" approach, it will be possible for companies to acquire spectrum geared to their current needs, *as well as purchase any further building blocks they deem necessary to provide future services*. The Commission *should* permit would-be service providers to bid for spectrum blocks in whatever number as will permit them to configure their services to best advantage. But the Commission should not waste spectrum and encourage inefficiencies by allocation *unnecessarily large* spectrum blocks.

If bidders wish to acquire larger blocks, the Commission should permit them to bid for the appropriate number of 20 MHz and 10 MHz blocks.[31] *But, the Commission should not pre-suppose that even two providers will require or make the best use of 30 MHz blocks.*

The Commission should therefore adopt four 20 MHz blocks in the lower band and retain four 10 MHz blocks in the upper band, and allow prospective service providers to bid for the blocks necessary to deliver their target services. This refinement of the PCS regime will provide parties with the "flexibility to match an applicant's specific needs with spectrum [and] should promote efficient use of the

---

[29]Comments of Pass Word, filed November 10, 1992, at p.3.

[30]Joint Comments of AMT/DSST, filed January 3, 1994, at p.5.

[31]To the extent that 40 MHz is held necessary to deliver some services, the Commission should clarify that all providers may reach such a cap.

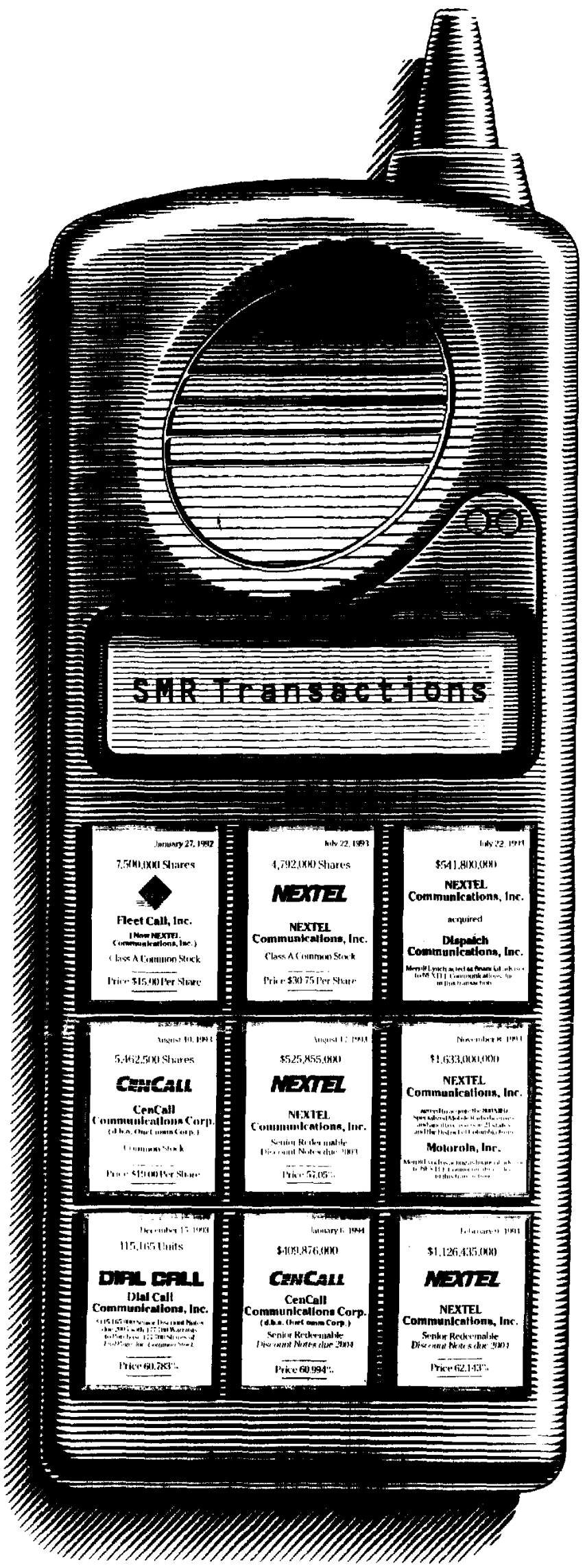
spectrum resource."[32]

Rather than adopting a policy which will require disaggregation of blocks to permit small companies and entrepreneurs to enter the market, the Commission should adopt a building block policy which will permit such companies to immediately enter the market, while not foreclosing the assembly of larger blocks of spectrum.

Such a policy will encourage capital investment, foster the development of sustainable companies, and create new job opportunities in the telecommunications marketplace.

---

[32] *Second Report and Order* at para. 59.



THE DIFFERENCE BETWEEN VISION AND REALITY

Building a state-of-the-art digital wireless network across North America required vision, innovative technology—and capital. Merrill Lynch shared that vision and has raised more than $1.6 billion for specialized mobile radio (SMR) companies—far more than any other firm.

In a few short years, the digital SMR industry has emerged as a powerful factor in telecommunications. Merrill Lynch has been there from the beginning, with the industry's first IPO, numerous debt and equity financings and strategic advice tha helped these companies prosper and turn their vision into reality.

With a dedicated team of industry specialists, we provide our telecommunications clients global resources combined with local expertise. As the wireless revolution continues around the world, we remain committed to its success. For our clien this commitment has been the difference betweer vision and reality.

The difference is Merrill Lynch.

Merrill Lynch
A tradition of trust.

Building The Wireless Future

CTIA

Cellular
Telecommunications
Industry Association
1250 Connecticut
Avenue, N.W.
Suite 200
Washington, D.C. 20036
202-785-0081 Telephone
202-785-0721 Fax

May 24, 1994

Mr. Donald Gips
Deputy Chief, Office of Plans & Policy
Federal Communications Commission
1919 M Street, N.W. - Room 822
Washington, D.C. 20554

RE: Ex Parte Letter
Personal Communications Services - Docket No. 90-314

Dear Mr. Gips:

As part of its Reconsideration of the PCS Report and Order the FCC is considering what should constitute the appropriate ownership attribution in order to determine a cellular operator's eligibility for new spectrum.

The current formulation for determining eligibility for spectrum is a two-step process:

(1) A "cellular carrier" is any entity (including individual investors) with 20 percent or more ownership. Thus, 20 percent of equity equates to 100 percent ownership attribution, *and*

(2) Such a "cellular carrier" may not own more than 10 percent of the pops in a market in order to be eligible for MTA-sized licenses.

These tests are unduly restrictive; the effective control of only two percent of the pops in an MTA (20 % x 10 %) could preclude a bid on that entire MTA. What is more, since small companies and small investors tend to own small pieces of licenses (while big companies tend to own bigger amounts) such a rule falls hardest on entrepreneurs.

Consider the following examples. The Mount Vernon-Centralia, IL, BTA (which has a total population of 118,200 and encompasses parts of three cellular RSAs) has five licensees, each of which has over 10 percent of the pops:

Cellular of Indiana
Rural Cellular Management
Ameritech Mobile
First Cellular of Southern Illinois
SWB Mobile

There are eight investors in these five licensees, each of which owns 20 percent or more of the license:

Hilah Douglas	Southern Illinois Cellular
SWB Mobile	GTE/Contel
Illinois Consolidated Telephone	Inland Cellular Telephone
Ameritech Mobile	Pacific National Cellular

Consider the ownership attribution of each of these investors in the Mount Vernon-Centralia, IL, BTA (which, again, has a total of 118,200 pops):

Investor	Ownership	x	No. Pops	=	Attributable Pops in BTA & % of BTA	
Hilah Douglas	**100 %**		**51,700**		**51,700**	**43.7 %**
SWB Mobile	**100 %**		**41,500**		**41,500**	**35.1 %**
Pac. Nat'l Cellular	**100 %**		**24,400**		**24,400**	**20.6 %**
Inland Cellular	**33.3 %**		**41,600**		**13,820**	**11.7 %**
Ameritech Mobile	**33.3 %**		**41,600**		**13,820**	**11.7 %**
Illinois Consolidated Tel.	**33.3 %**		**41,600**		**13,820**	**11.7 %**
GTE/Contel	**41.1 %**		**76,700**		**31,524**	**26.7 %**
Southern Illinois Cellular	**54.8 %**		**76,700**		**42,032**	**35.6 %**

The financial community utilizes calculations such as the one immediately above to determine asset value of a company. The approach has been used for over a decade to determine attributable ownership. Why, then, does the FCC seek to develop a more complex, two-step procedure?

The effect of the FCC's rule is to limit a small cellular company's ability to participate by putting the pop threshold at an unbearably low 10 percent and, then, establish that 20 percent ownership is the metaphysical equivalent of 100 percent ownership. CTIA has previously submitted a study by Charles River Associates establishing that one entity's ownership of up to 40 percent of all the pops in the market has no negative effect on competition.

In fact, some 1,561 opportunities for such "cellular companies" to fully participate in PCS are restricted by the FCC's 10 percent overlap rule in 487 of the PCS BTAs, even using the financial community's proportionate attribution standard. But over 640 of these opportunities will be opened up by adopting a 40 percent overlap standard.

Companies By Overlap Percentage Baskets

10 - 19.9 %	20 - 24.9 %	25 - 29.9 %	30 - 34.9 %	35 - 40 %	40 % +
299	126	75	74	72	915

Total Opportunities Constrained = 1,561

Total Opportunities between 10 and 40 % = 646

If you have any questions about the foregoing, please contact the undersigned.

Very truly yours,

Thomas E. Wheeler

President/CEO

Stamp + Return

Building The Wireless Future

CTIA
Cellular Telecommunications Industry Association
1250 Connecticut Avenue, N.W.
Suite 200
Washington, D.C. 20036
202-785-0081 Telephone
202-785-0721 Fax

May 13, 1994

Mr. Ralph Haller
Chief, Private Radio Bureau
Federal Communications Commission
2025 M Street, N.W. - Room 5002
Washington, D.C. 20554

RE: Personal Communications Services - Docket No. 90-314

Dear Mr. Haller:

In response to your query, the following outlines the degree to which the ownership interest rules impact cellular companies and investors in the PCS Basic Trading Areas (BTAs).

Examination of any number of BTAs reveals the extreme and unnecessary impact of the Commission's ownership and overlap rules, and the degree to which CTIA's proposal will permit greater participation by cellular companies and investors in adjacent geographic areas.

For example, in the Louisville Major Trading Area, the Lexington BTA is composed of 35 counties, with a population estimated at 861.5 thousand (per the 1994 population estimates in Paul Kagan Associates' *1994 PCS Atlas and Databook*). The Lexington BTA is served by nine licensees -- Alpha Cellular, Appalachian Cellular, Bell Atlantic Mobile, BellSouth Mobility, Cellular Phones of Kentucky, Contel Cellular, Danbury Cellular, First Kentucky and Mountaineer Cellular. *Of these nine companies, five are restricted by the ownership/overlap rules.*

Company	Counties Served Out of BTA Total	Estimated Pops	Percentage of BTA Total Served
Bell Atlantic Mobile	9 out of 35	116.5 thousand pops	13.5 percent
BellSouth Cellular	17 out of 35	530.4 thousand pops	61.6 percent
Contel Cellular	6 out of 35	376.8 thousand pops	43.7 percent
Danbury Cellular	12 out of 35	214.4 thousand pops	24.9 percent
Mountaineer Cellular	9 out of 35	116.5 thousand pops	13.5 percent

CTIA's proposed 40 percent overlap threshold would permit three of these companies to pursue serving the adjacent counties -- which are outside their existing cellular service areas -- with more than 10 MHz of spectrum.

Like examples exist in other BTAs. Within the Louisville MTA, the Corbin BTA has a population estimated at 134.1 thousand, and it is served by four cellular companies. *All of these companies are restricted by the Commission's overlap rules.*

Company	Counties Served Out of BTA Total	Estimated Pops	Percentage of BTA Total Served
Cellular Phone of Kentucky	1 out of 4	47.1 thousand pops	35.1 percent
Contel Cellular	3 out of 4	87.0 thousand pops	64.9 percent
Danbury Cellular	1 out of 4	47.1 thousand pops	35.1 percent
First Kentucky Cellular	3 out of 4	87.0 thousand pops	64.9 percent

Similarly, in the Somerset BTA, also in the Louisville MTA, which has a population estimated at 117.0 thousand, Danbury Cellular and Bluegrass Cellular each serve 3 out of 5 counties, with 49.8 thousand pops (42.6 percent), while BellSouth serves one out of 5 counties, with 14.3 thousand pops (12.2 percent). *All three are restricted under the Commission's overlap rules.*

Similar examples can be found across the nation. For example, in the Watertown BTA (in the New York MTA), which is made up of four counties with an estimated population of 309.0 thousand, four cellular companies provide service. *All four are restricted under the Commission's overlap rules.*

Company	Counties Served Out of BTA Total	Estimated Pops	Percentage of BTA Total Served
Adirondack Limited Partnership	1 out of 4	47.1 thousand pops	15.2 percent
Contel Cellular	1 out of 4	47.1 thousand pops	15.2 percent
NYNEX Mobile	3 out of 4	262 thousand pops	84.8 percent
U.S. Cellular	3 out of 4	262 thousand pops	84.8 percent

Likewise, in the Florence South Carolina BTA (in the Charlotte MTA), which is made up of four counties with an estimated 249.6 thousand pops, four cellular companies provide service. *All four are restricted under the Commission's overlap rules.*

Company	Counties Served Out of BTA Total	Estimated Pops	Percentage of BTA Total Served
BellSouth Cellular	4 out of 4	249.6 thousand pops	100 percent
GTE MobileNet	1 out of 4	120.8 thousand pops	48.4 percent
U.S. Cellular	2 out of 4	93.7 thousand pops	37.5 percent
Vanguard Cellular	1 out of 4	35.2 thousand pops	14.1 percent

Moreover, these carriers' minority partners or investors -- which include Palmetto MobileNet (PMN) in the Florence BTA -- are also restricted by the rules, as was noted by PMN in its pleadings on Reconsideration.

As Palmetto MobileNet argued in its Reply to Oppositions to Petitions for Reconsideration, filed January 13, 1994, at p.3, "the arguments it has made and those advanced by others uniformly provide firm support for relaxation of the cellular eligibility and attribution rules, if not their outright elimination."

CTIA's proposed higher attribution and overlap standard will permit more companies already active in mobile services to extend service beyond their existing cellular boundaries, by acquiring additional spectrum -- taking advantage of their existing infrastructure and knowledge, and their interest in offering innovative new services both in and outside of their existing markets.

If you have any questions about the foregoing, please contact the undersigned.

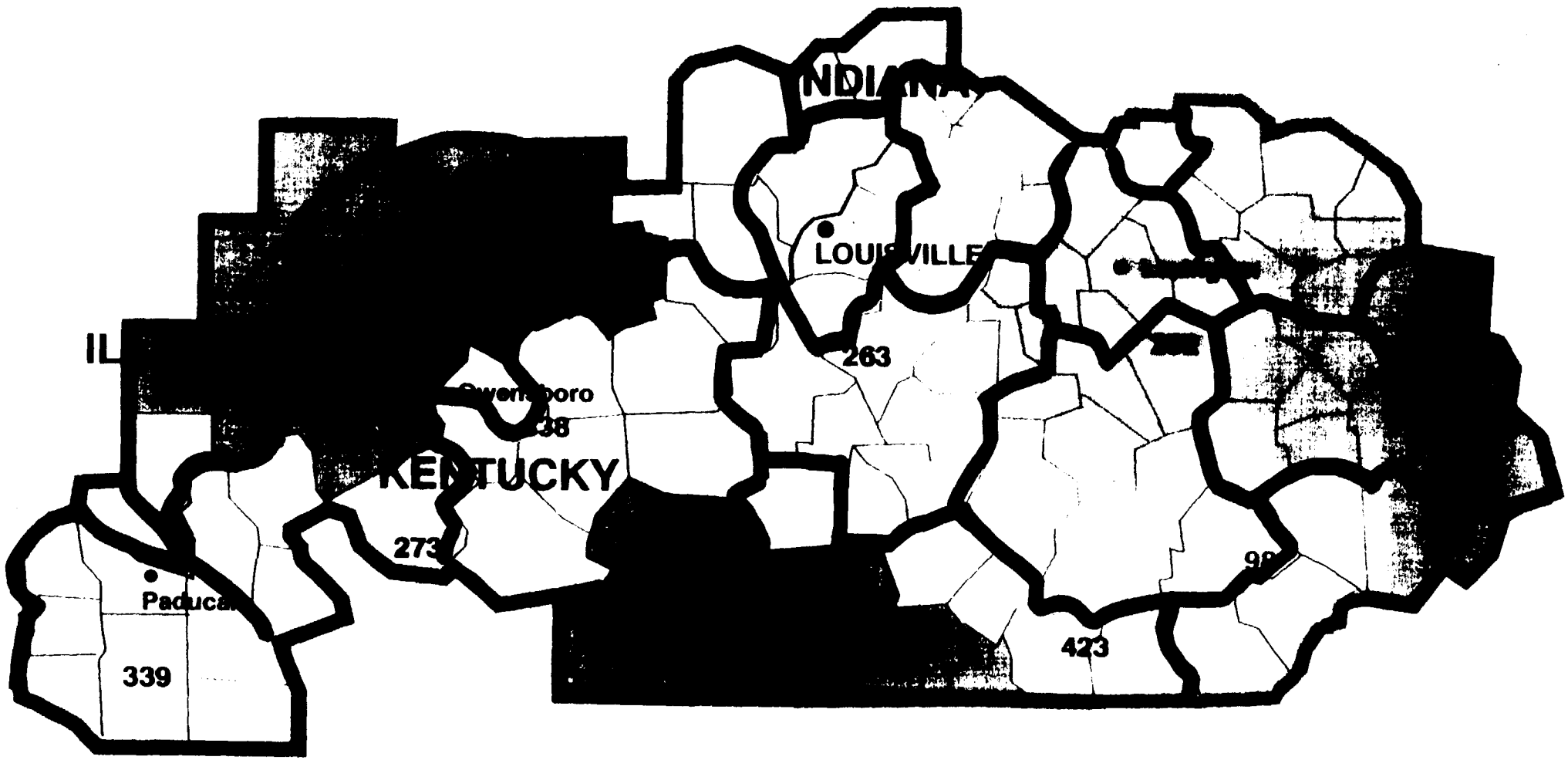
Very truly yours,

Robert F. Roche

Attachment

cc: Donald Gips
Gregory Rosston

LOUISVILLE
MAJOR TRADING AREA



Legend: On the base map, different BTAs are defined by color, and associated number. Number 252 is the Lexington BTA, 98 is the Corbin BTA, and 423 is the Somerset BTA.
On the overlay, red lines indicate MSA/RSA boundaries.

February 4, 1994

Commissioner Andrew C. Barrett
Federal Communications Commission
1919 M Street, N.W. Room 826
Washington, D.C. 20554

C T I A Cellular Telecommunications Industry Association
1133 21st Street, NW
Third Floor
Washington, DC 20036
202-785-0081 Telephone
202-785-0721 Fax

Building The Wireless Future

Thomas E. Wheeler
President/CEO

Re: Ex Parte
Docket No. 90-314 (Personal Communications Services)

Dear Andy:

The attached White Paper, *PCS Rules Too Restrictive on Cellular, Study Finds: Antitrust Measurements Show Restrictions Not Necessary to Promote Competition,"* uses the Department of Justice's and Federal Trade Commission's Horizontal Merger Guidelines to show that the FCC's rules hamper, and not serve, the economic growth potential of new wireless services. The recent study by Charles River Associates (CRA) concluded that the FCC's broadband personal communications service (PCS) rules place restrictions on cellular service providers that are unnecessary.

CRA found that even in worst case scenarios, permitting cellular providers to participate like other firms in the new market would likely have little effect on the wireless telecommunications industry's competitiveness.

According to the CRA study, the FCC's rules bear reconsideration for three basic reasons.

- Restrictions on the participation of cellular providers are based on overly-conservative and arbitrary assumptions about market concentration and competitiveness which are inconsistent with the federal government's own standards of market concentration.

- Market definition from the perspective of technology is too narrow -- as technologies converge, it is no longer appropriate to think of openly competing services as distinct products in distinct markets.

- Basic Trading Areas (BTAs) are not relevant market distinctions, well-established antitrust standards prove them to be arbitrary.

The FCC may change its rules restricting cellular providers' ability to obtain PCS spectrum without fear of an anticompetitive result in the wireless marketplace. In fact, CTIA's proposal that the Commission award four 20 MHz and four 10 MHz licenses *will produce a lower concentration than could be anticipated under the FCC's rules.*

Very Truly Yours,

Thomas E. Wheeler

Building The Wireless Future

CTIA
Cellular
Telecommunications
Industry Association
1250 Connecticut
Avenue, N.W.
Suite 200
Washington, D.C. 20036
202-785-0081 Telephone
202-785-0721 Fax

PCS WHITE PAPER No. 3
Second Series

PCS Rules Too Restrictive on Cellular, Study Finds:

Antitrust Measurements Show Restrictions Not Necessary to Promote Competition

February 4, 1994

PCS Rules Too Restrictive On Cellular, Study Finds: Antitrust Measurements Show Restrictions Not Necessary to Promote Competition

Using the Department of Justice's and Federal Trade Commission's Horizontal Merger Guidelines, Charles River Associates (CRA) has concluded that the FCC's broadband personal communication services (PCS) rules place restrictions on cellular service providers that are unnecessary -- and possibly anti-competitive.

CRA found that: **"Even in the most highly concentrated market structure possible under pending PCS rules, the Merger Guidelines would not bar, and might not even warrant investigation of, significant acquisitions of capacity by incumbent cellular operators."**[1]

The goals underpinning the FCC's rules -- ensuring that the market for new wireless services is competitive and that consumers have adequate protection -- are laudable. As it reconsiders its rules over the next several weeks, the FCC must realize that its initial PCS decision does not achieve these goals. *The FCC's rules instead threaten the economic growth potential of these new wireless services.*

According to the CRA study, the FCC's rules bear reconsideration for three basic reasons.

- Restrictions on the participation of cellular providers are based on overly-conservative and arbitrary assumptions about market concentration and competitiveness which are inconsistent with the federal government's own standards of market concentration.

- Market definition from the perspective of technology is too narrow -- as technologies converge, it is no longer appropriate to think of openly competing services as distinct products in distinct markets.

- Basic Trading Areas (BTAs) are not relevant market distinctions, well-established antitrust standards prove them to be arbitrary.

The FCC may change its rules restricting cellular providers' ability to obtain PCS spectrum without fear of an anticompetitive result in the wireless marketplace. In fact, CTIA's proposal that the Commission award four 20 MHz and four 10 MHz licenses *will produce a lower concentration than could be anticipated under the FCC's rules.*

---

[1]The Merger Guidelines use the Herfindahl-Hirschman Index (HHI) to measure market concentration, based on summing the squares of the individual market shares of all of the market participants. Thus, in a market with 10 firms, each with a market share of 10 percent, the HHI would be 1000. A market composed of seven firms, with two firms having shares of 25 percent each and the remaining firms having shares of 10 percent each, would have an HHI of 1750. (Each firm with 25 percent contributes 625 ($25^2 = 625$), and each firm with 10 percent contributes 100, hence $625 + 625 + 5(100) = 1750$.) As explained below, in unconcentrated and moderately-concentrated markets HHI increases of 100 points are necessary before competitive concerns may be raised, and in highly-concentrated markets HHI increases of 50 points are necessary before competitive concerns are raised.

Market Competitiveness: Why Cellular Restrictions Don't Make Sense

The Commission adopted its limitations on the amount of bandwidth for which cellular providers are eligible out of a legitimate interest in keeping the market for the new wireless services as competitive as possible.

But by applying the Horizontal Merger Guidelines the CRA study found that, *even in worst case scenarios, permitting cellular providers to participate like other firms in the new market would likely have little effect on the wireless telecommunications industry's competitiveness.*

The Merger Guidelines generally conclude that post-merger measures of HHI below 1000 indicate an unconcentrated market, with adverse competitive effects being unlikely. Post-merger HHIs between 1000 and 1800 indicate moderate concentration. Mergers producing HHI increases of less than 100 are unlikely to have adverse competitive effects. Neither of the foregoing examples would require further analysis under the guidelines. Mergers producing increases of more than 100 points may raise competitive concerns, depending on other conditions.

Post-merger HHIs of above 1800 indicate that a market is highly concentrated, although mergers producing an increase in the HHI of less than 50 points are unlikely to have adverse competitive effects. Mergers producing increases of more than 50 points may raise competitive concerns, depending on other conditions. Mergers producing increases in the HHI of more than 100 points are presumed to enhance market power or its exercise, although the presumption may be overcome by other factors making such exercise unlikely.[2]

CRA calculated the HHIs for the mobile telecommunications marketplace under scenarios in which cellular companies do not acquire additional MHz, as well as ones in which they acquire 10 MHz or 15 MHz. The scenarios also included entry by Specialized Mobile Radio (SMR) providers, and the effect of both the Commission's and CTIA's proposed licensing schemes.

Even CRA's worst case calculations of HHIs -- in a highly-concentrated market -- produced only one instance in which an acquisition would rise by 50 points, to meet the bare minimum for consideration of an investigation.

The basis of these calculations is the *effective capacity* of the spectrum available for mobile telecommunications service. While the 170 MHz of bandwidth available for PCS and cellular (120 MHz and 50 MHz, respectively) *could* be used to produce measures of potential market share, a simple measure of bandwidth is not a meaningful measure of the power any individual firm has in the wireless telecommunications market. Although each cellular provider does have 25 MHz of spectrum in the markets in which it operates, FCC rules require cellular

---

[2]Compensating factors include conditions facilitating or inhibiting collusion, the potential for expansion by existing competitors, and the potential for entry by new competitors.

operators to accommodate their current analog customers. Because cellular carriers will therefore be unable to convert all their spectrum to digital, their spectrum has less *effective capacity* than spectrum that can be used exclusively to provide more spectrum-efficient digital services.[3] Therefore, the calculations take into account the effective capacity available under various scenarios.

Merger Guidelines - HHI Index Example

If two celcos each had 10 MHz of PCS spectrum, and one acquired an additional 5 MHz of spectrum, the HHI index indicates that both the pre-existing and the resulting market concentration would be moderate. As the increase in the HHI resulting from the acquisition is under 100 it would not warrant concern or further analysis under the guidelines.

	Pre-Acquisition				Post-Acquisition			
Firms	Bandwidth	Capacity	Share (%)	HHI	Bandwidth	Capacity	Share (%)	HHI
Celco1	35	160	17.4	302	40	190	20.7	427
Celco2	35	160	17.4	302	35	160	17.4	302
PCS-A	30	180	19.6	383	30	180	19.6	383
PCS-B	30	180	19.6	383	30	180	19.6	383
PCS-C	20	120	13.0	170	20	120	13.0	170
PCS-D	10	60	6.5	43	10	60	6.5	43
PCS-E	10	60	6.5	43	5	30	3.3	11
Total	170	920	100	1,626	170	920	100	1,718

Assumptions: That the celcos maintain 10 MHz of bandwidth to serve analog cellular customers, and that digital enjoys a 6-to-1 capacity relationship with analog.

The following examples show that, with or without the analog handicap, the FCC's current PCS rules make little sense:

- A cellular provider that won a 10 MHz PCS license but had to retain 10 MHz of its cellular spectrum for analog services in a given market would only have a 17.4 percent share of the market's effective capacity. By contrast, a PCS competitor that won a 30 MHz MTA-wide license would automatically have a 19.6 percent market share, and would face no analog handicap or other FCC-imposed limitations. A 40 MHz licensee would have a 23.5 percent market share.

[3]The precise advantage of digital over analog depends in part on the technology involved, and increases in capacity may range from a multiple of 2 to 18. CRA relied upon a multiple of 6, and assumed 10 MHz of a cellular operator's bandwidth would remain devoted to analog customers. CRA Study at p.37.